Open RPG Training

Presented by the

Warning Decision Training Branch

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Overview

This document is one part of a suite of training materials available to aid NWS staff in the familiarization process with the Open RPG (ORPG). An important resource is the ORPG Training Web Site. It will provide information about and access to a variety of training resources (See Figure 1). The address is

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http://www.roc.noaa.gov/osteam/osmain.htm
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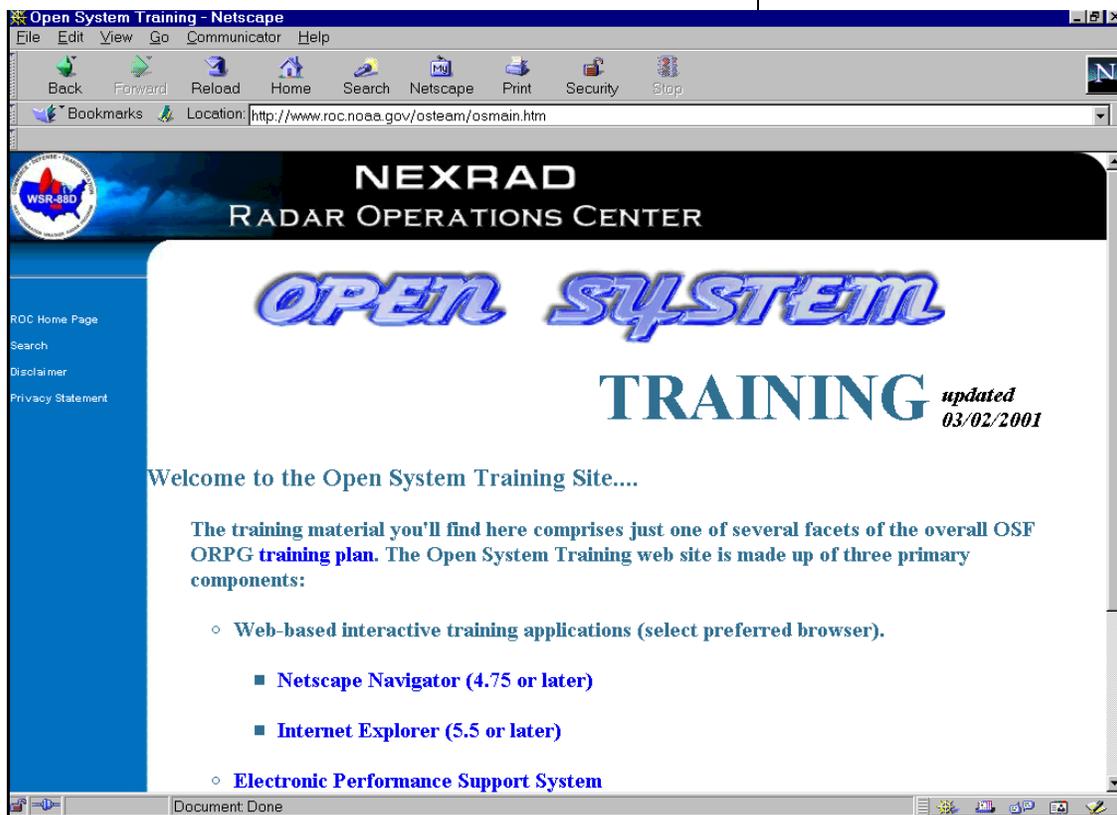
Figure 1. ORPG Training Web Site

This document was developed as a companion to the ORPG teletraining sessions presented by the Warning Decision Training Branch (WDTB). The ORPG teletraining has two primary goals. The first is to provide an overview of the ORPG training resources available to you. The second is to pro-

vide familiarization with the ORPG Human Computer Interface (HCI).

Features of the ORPG Training Web Site

Since the ORPG is a replacement for the WSR-88D legacy RPG, there is an associated significant need for training. There are a variety of training resources available to meet this need. The ORPG Training Web Site provides an overview of these resources as well as direct access to some of the materials, for example, web-based modules.

ORPG Training Plan

The ORPG Training Plan outlines the strategy for providing training using a variety of distance learning delivery methods. The ORPG Training Plan can be found at

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http://www.roc.noaa.gov/osteam/tplan.htm
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ORPG Computer Based Training (CBT)

The ORPG Computer Based Training (CBT) is delivered on CD-ROM and has two components.

Open Architecture RPG System Description

The first component is the Open Architecture RPG System Description. This presents an overview of the ORPG system, with an emphasis on hardware and communications.

RPG Human Computer Interface

The RPG Human Computer Interface component is a comprehensive training resource, with information on nearly every function of the ORPG interface. It is focused on the interface since that is where an operator will interact with the ORPG for operational duties. This training module takes 2-3 hours to complete and is strongly recommended.

Additionally, an Electronic Performance Support System (EPSS) is available to you at the ORPG desktop through the Netscape browser. The EPSS provides a quick reference for operators generally familiar with the ORPG Interface. An EPSS is distinguished from a Help system by its design. An EPSS is task oriented, with step-by-step instructions written as a quick reminder for a user already familiar with the system.

Electronic Performance Support System (EPSS)

The front page of the EPSS is an alphabetical listing of links to the instructions for various tasks (See Figure 2). The user can scroll down the list to the link that is relevant to the task at hand.

EPSS Front Page

RPG HCI

Electronic Performance Support System (EPSS)

Alarms, RDA,
-Displaying
-Sorting

Alarms, RPG
-Displaying
-Printing

Alert Paired Products

**Alert Thresholds,**
-Groupings
-Setting
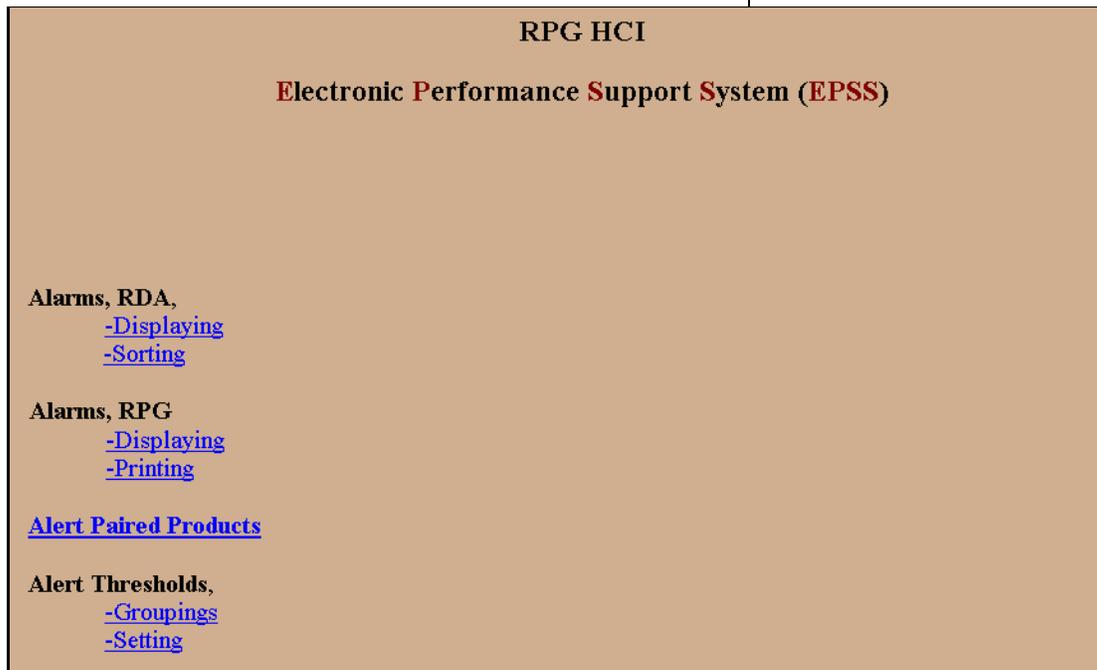
Figure 2.   EPSS Front Page

As an example, assume that it's been decided that the Z-R relationship needs to be changed. Since this is typically done infrequently, you might want to use the EPSS as a quick reference for the steps involved instead of hunting though windows on the HCI. The following is a sample of the steps for the Z-R change.

EPSS Example

1) At the RPG Control/Status window (HCI main screen), click the Products icon. This action displays the RPG Products menu.
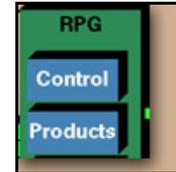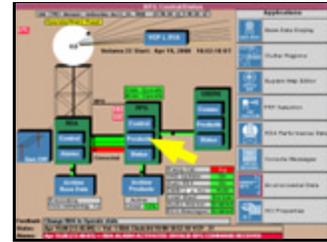
2) At the RPG Products menu, click the Algorithms button. This action displays the Algorithms editor.
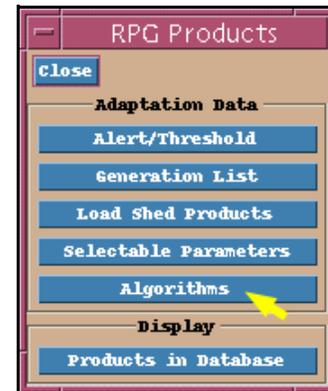
3) At the Algorithms editor, click the Lock button. This action produces two results: it highlights editable values in white and displays a Password window.
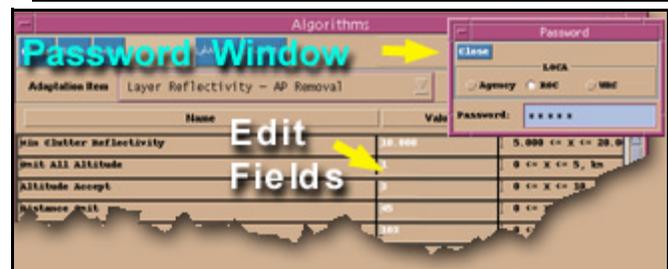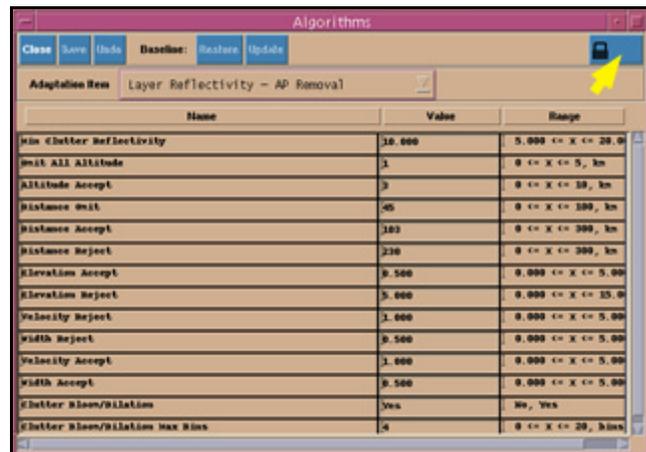
This section of the EPSS will continue with the remaining steps to change the Z-R relationship.

Open System - What is it and Why would we want it?

The use of the term "Open System" with respect to rehosting the RPG refers to the following:

1. Designing a computer environment which is vendor independent and compatible to industry and government standards.

2. Purchasing "off the shelf" items not specifically designed for the RPG application.

The Open System design provides a system with much greater flexibility than the legacy RPG. The system is interoperable, meaning the various components communicate with one another. The system allows for portability of software, data and users. The system is scalable, meaning that it can be upgraded incrementally as technologies improve, rather than replacing the entire system.

Legacy RPG Replaced

The deployment of the ORPG is not considered a system upgrade, since it is physically replacing the legacy RPG. The associated technical documents have been rewritten, with the ORPG referred to simply as the RPG. However, for the purposes of training and clarity, this document and the associated teletraining presentation will refer to the new system as the ORPG.

Benefits of the ORPG

One of the primary benefits of an Open System RPG is easier upgrades in the future. This is with respect to both hardware and software. It will be easier to upgrade to faster processors and higher volume communications devices. Since the various hardware components are interchangeable, a redesign of the system is usually not necessary when a new hardware suite is desired.

Compliance with industry and government approved open systems standards applies to the the communications protocols, the operating system (UNIX), and the programming language (C). This helps to ensure compatibility with future technologies which may be used in the system. Software upgrades, such as new algorithms, can occur more frequently, and will be portable to other platforms.

ORPG Hardware and Software

The ORPG hardware system involves several components that support networking and communications, in addition to control of the WSR-88D. Figure 3 provides a functional diagram of the components. The module on CD-ROM, "Open Architecture RPG System Description", provides a description of each system component.

Wideband data (Base Data and RDA status information) are sent from the RDA to the RDA/RPG Gateway where the protocol is translated from X.25 to the TCP/IP protocol used by the ORPG. The base data are then sent to the LAN Switch which directs the data to both the RPG processor and the Base Data Distribution Server (BDDS). The BDDS is used to transmit base data to other users. The RPG processor then processes the base data into products and distributes the products and status/maintenance information to the Archive III device and (via the LAN Switch) to the Comm Servers. The Comm Servers convert the products from TCP/IP into X.25 for distribution via modem to the users.

ORPG Hardware
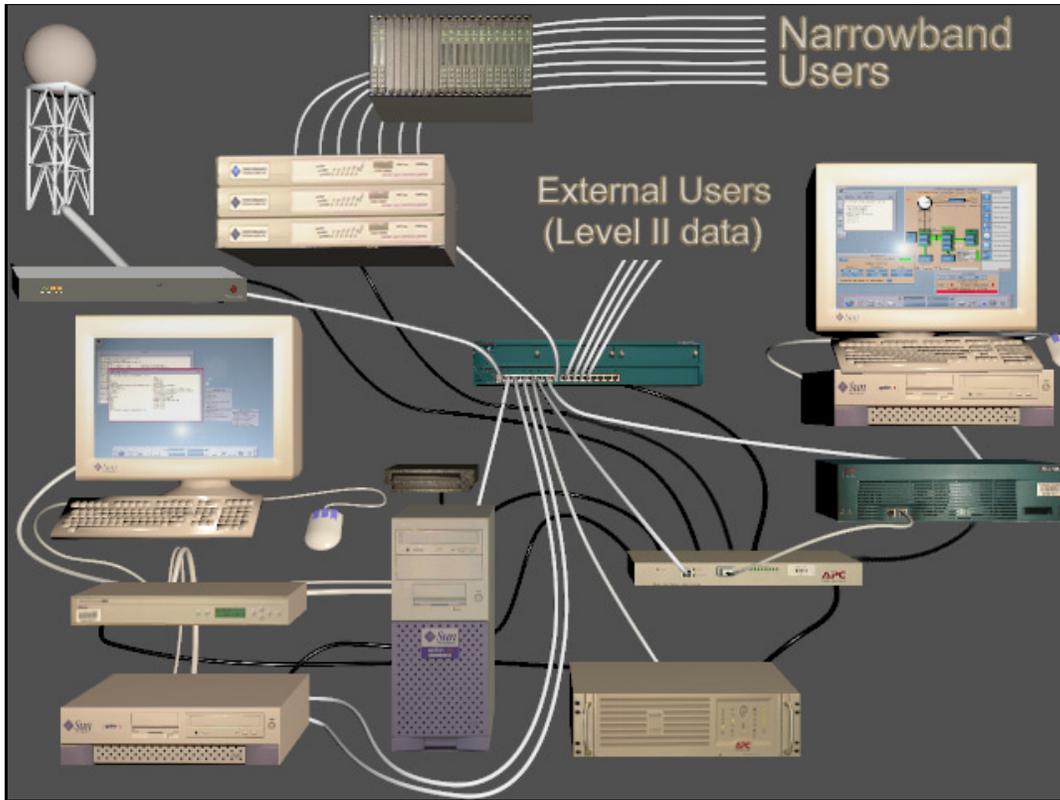
**Figure 3.** Overview of the ORPG System

Figure 4 is a photo of the contents of the ORPG Cabinet. The RPG Processor and the Archive III device (JAZ drive) are located in the lower left area.

The workstation where operators normally access the ORPG interface is located *outside* the cabinet, typically in the operations area. It is known as the Master System Control Function (MSCF) workstation.
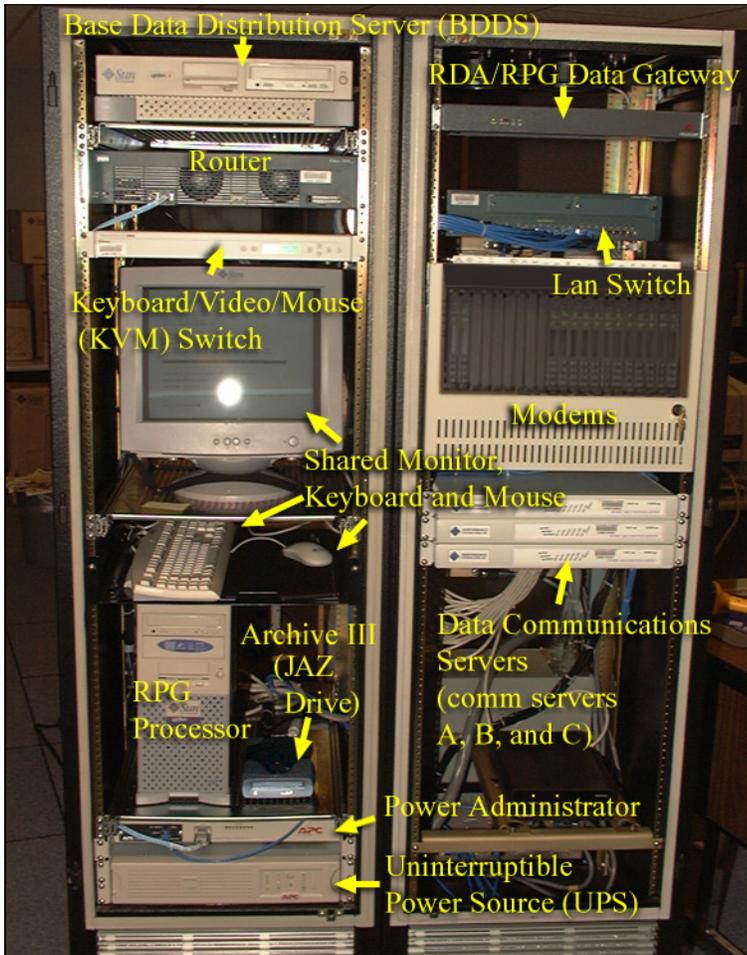
Figure 4. The MSCF Workstation and a look inside the ORPG Cabinet.

ORPG Software

Master System Control Function (MSCF)

The Master System Control Function (MSCF) refers to the set of software processes that allow operator control of the radar. The MSCF is not limited to the RPG. For example, it will eventually include control of the terminal at the RDA. See Figure 5 for an example of the MSCF Human Computer Interface (HCI) which is the window that displays the various functions that are controlled by the MSCF. This window will normally be displayed on the MSCF workstation, which is outside the ORPG cabinet.
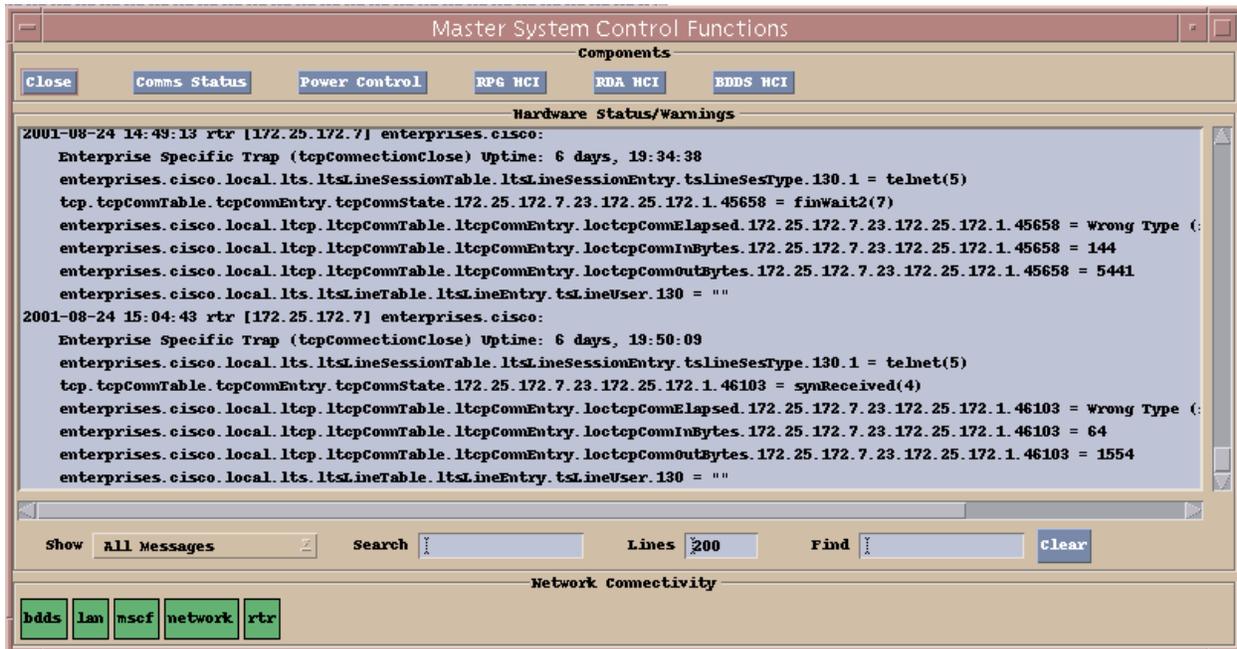
Figure 5. Master System Control Function (MSCF) Human Computer Interface (HCI)

Note the RPG HCI button on the MSCF HCI. This will start the interface that operators use to access the ORPG.

How to start the MSCF HCI

The close button on the MSCF HCI makes it easy to close the window, and could be done accidentally. However, opening the MSCF HCI is easily done from the CDE Task bar (see Figure 6). Clicking on the arrow above the "cpu disk" button will reveal the Host menu. Clicking on "This Host" will launch the MSCF HCI.

ORPG Human Computer Interface (HCI)

A strength of the ORPG for the user is the Human Computer Interface (HCI), which allows the user access to WSR-88D status information and control functions. The ORPG HCI is launched from the MSCF HCI using the RPG HCI button.

Figure 6.   CDE Task Bar and menu to start the MSCF HCI.

Though there is more than one HCI, for the rest of this document and for the teletraining, "HCI" refers to the ORPG HCI. See Figure 7.
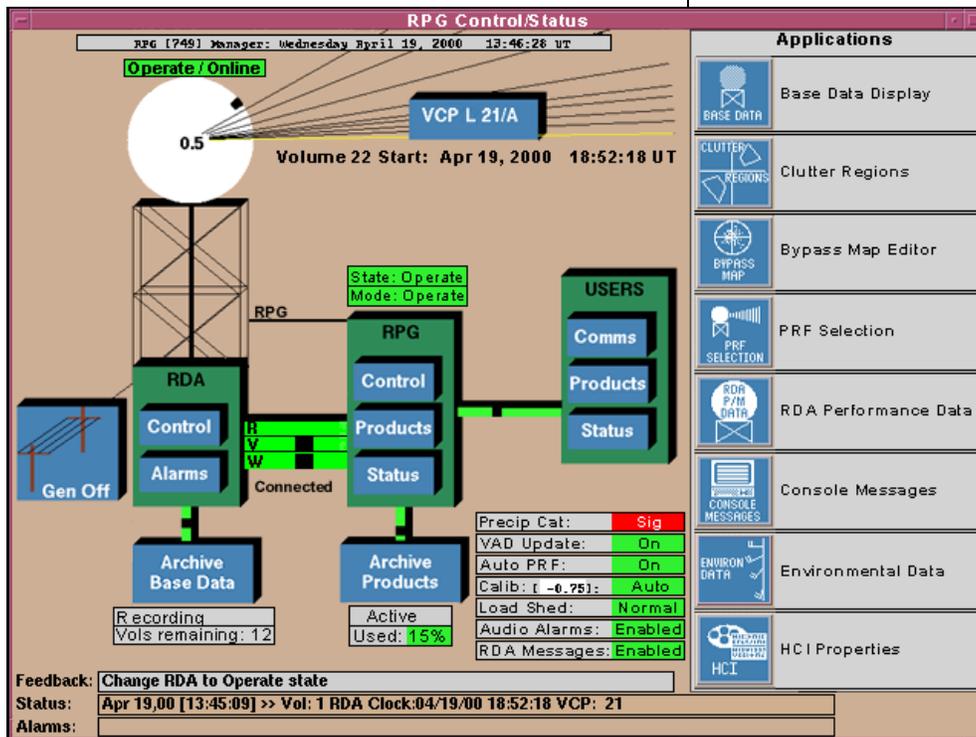

Figure 7.   HCI Main Screen

The HCI has a comprehensive design that provides much easier access to accomplish tasks formerly done at the UCP. The main screen of the

HCI is titled RPG Control/Status and is comparable to the RPG Main Menu at the UCP. The information is most often presented graphically, instead of the series of text menus found at the UCP. Another important feature of the HCI is that "hierarchy levels" are limited to two below the main screen. This means that nearly every HCI function is accessible from the main screen by one or two mouse clicks.

The HCI is divided into two primary functional areas. The large area that depicts the entire WSR-88D system graphically is called the RPG Manager. Within this area, the operator can assess system status and perform system control functions. On the right side of the HCI main screen is an area with a column of buttons. This is the Applications area, where specific tasks such as changes to Environmental Data and Clutter Suppression are performed.

A Word About LOCAs

There are numerous WSR-88D adaptable parameters that can be changed through the HCI. Each parameter has a particular Level of Change Authority (LOCA).

Unit Radar Committee (URC)

For NWS radar operators, the most frequently used LOCA would be the Unit Radar Committee (URC). Parameters with this LOCA would potentially affect the mission of the three agencies using the radar data. An example of a group of parameters with a URC LOCA would be the data levels for the precipitation and velocity products.

Radar Operations Center (ROC)

Another LOCA that may occasionally be encountered would be the Radar Operations Center (ROC). That is the change authority for scientific parameters, such as those in the meteorological algorithms.

The remaining LOCA would be Agency, which concerns changes that a single agency are authorized to implement. This LOCA typically involves user passwords and certain telecommuncations settings.

Agency

With the ORPG, changes to parameters that have LOCAs are password protected. An example would be changes made to a clutter suppression regions file, which is a URC LOCA. In the upper right corner of the Clutter Regions editor window is a padlock.

LOCAs and Passwords
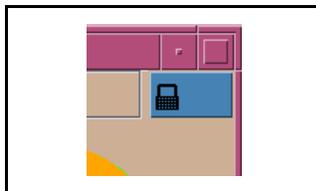
In order to make and save changes, the padlock must be unlocked with a password. Clicking on the padlock will open the password window.
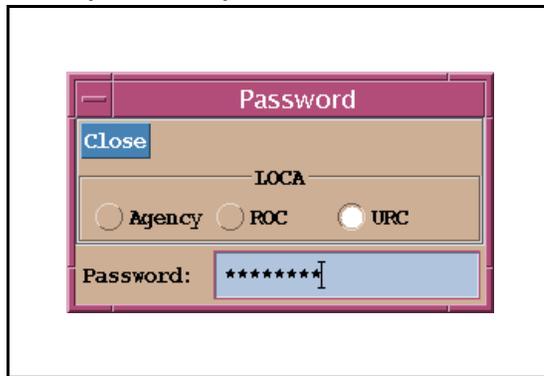
Once the password for URC is entered and this window is closed, the padlock on the Clutter Regions definition window will be open and changes can be made and saved.
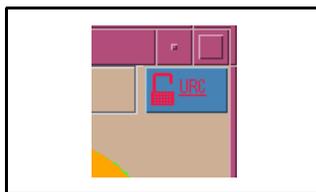
System Status

Using the HCI for Status Checks

In many cases, routine status checks can be made by simply inspecting the RPG Manager section of the HCI.
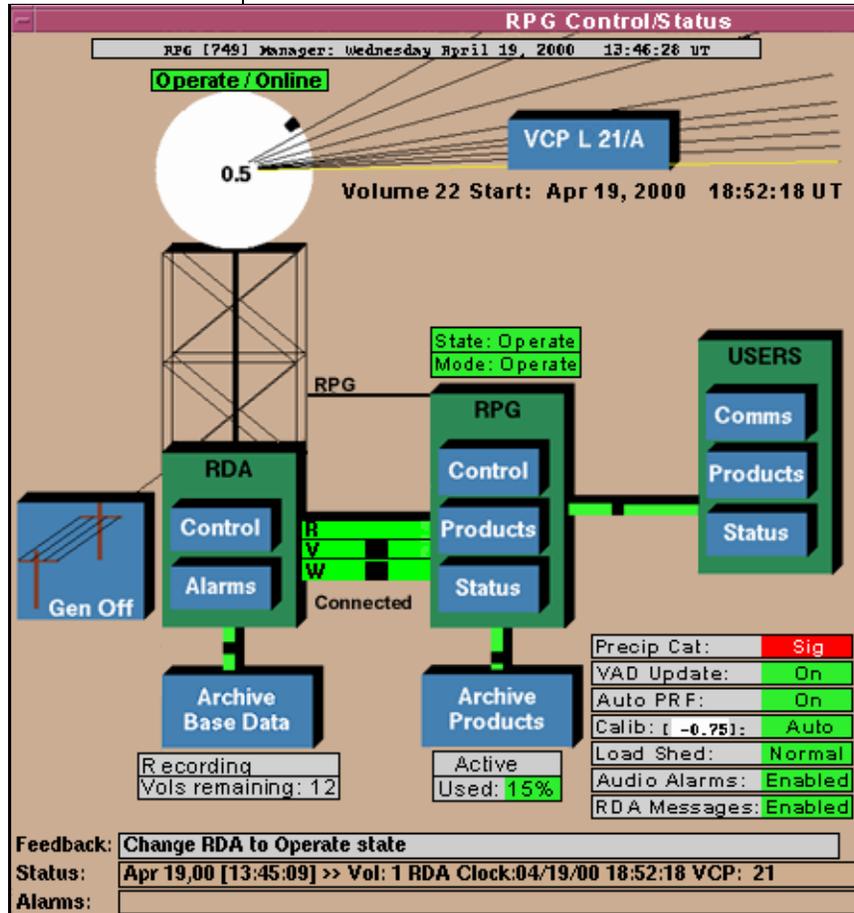
Figure 8. RPG Manager portion of the HCI. This example reflects the expected status information for a system operating normally with no alarms.

In Figure 8, the status information for a system which is operating normally with no alarms is displayed. Note the frequency of the color green! Examples include:

- RDA State (Operate) and Operable Status (OnLine)
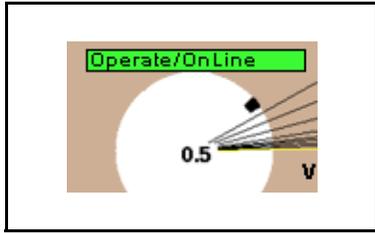
- RPG State (Operate) and Mode (Operate)
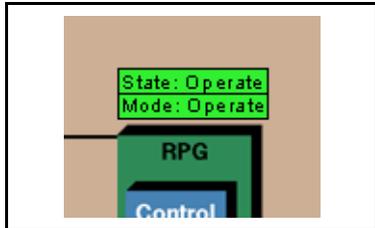
- Current VCP (21) and elevation angle (0.5°)
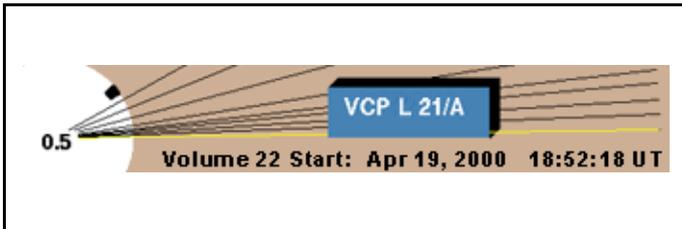
- Current power source (utility)
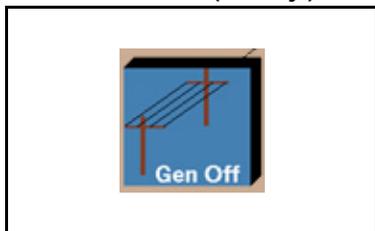
- Wideband Status (Connected) with enabled base moments (R, V, and W)
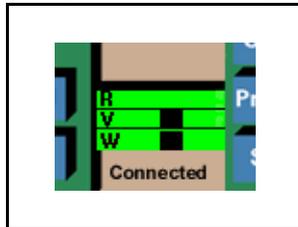
- Status of Archive II / Base Data Archive (Recording)
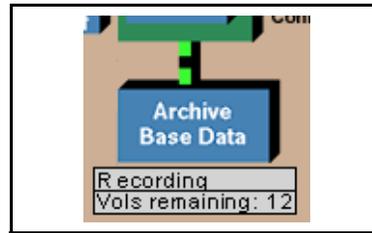
- Status of Archive III (Active)

- Current Precipitation Category (Significant)
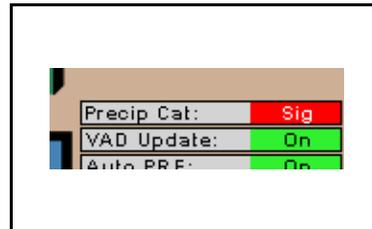
- Auto PRF On or Off (On)
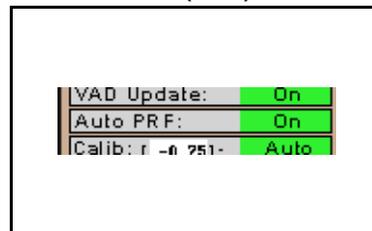
- Who has control of the RDA
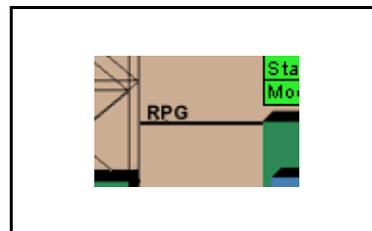
Status Indicators When There Are Problems

The CBT presents some examples of status information when there are problems. See Figure 9.

RDA Alarms

In Figure 9, note that the RDA state is Operate, but the operable status is Maintenance Required. Also
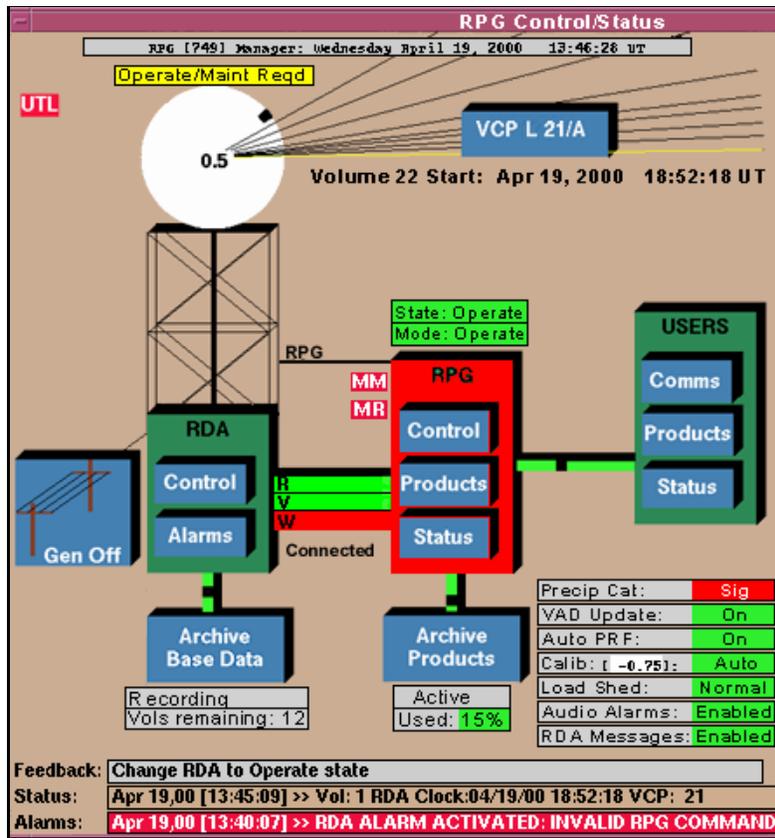
Figure 9. RPG Manager portion of the HCI from the CBT. There are problems with the system as indicated by the status information.

note that the display has a yellow background. If the RDA were inoperable, the display would have a red background. The red "UTL" button indicates an RDA Alarm condition with the Tower Utilities.
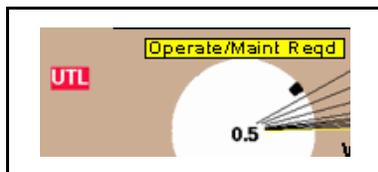
The RPG also has an alarm condition, in this case both maintenance mandatory and maintenance required. These are indicated by the red "MM" and "MR" buttons, as well as the red background of the RPG itself.

RPG Alarms

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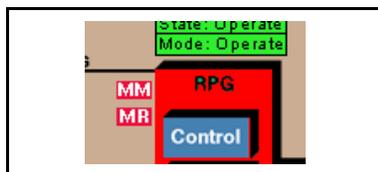
Wideband Status

In Figure 9, note the wideband status. The link is connected, but one of the three base moments, W (Spectrum Width), has a red background. The RPG is only receiving Base Reflectivity and Base Velocity.
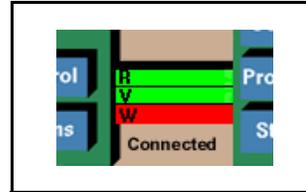
System Control

Some system control tasks are performed by accessing a window from the RPG Manager area of the HCI. Other tasks are initiated from the Applications area, with buttons for specific tasks. Some examples of system control tasks are provided in this section.

Narrowband Communications

The interface to assess narrowband communications line status as well as to perform disconnects/reconnects is called the Product Distribution Comms Status window. This window is accessed by selecting the Comms button in the Users area of the HCI.
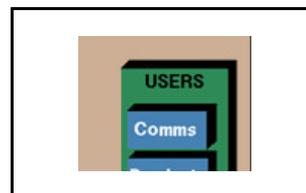
Product Distribution Comms Status window

The Product Distribution Comms Status window is both a status and control interface (See Figure 10).

Specific lines or groups of lines can be selected using keyboard standards such as shift and ctrl. To perform a disconnect followed immediately by a connect, use the reset button. Otherwise, use the disconnect and connect buttons as needed.

Product Distribution Comms Status

Close Save Undo   Baseline: Restore Update

Product Distribution Lines

Line	Type	Enabled	Proto	ID	User Name	Class	Status	Util	Rate
1	DIALIN	yes	X25			2	CON PEND	0%	0%
2	DIALIN	yes	X25			2	CON PEND	0%	0%
3	DIALIN	yes	X25			2	CON PEND	0%	0%
4	DIALIN	yes	X25			2	CON PEND	0%	0%
5	DIALIN	yes	X25			2	CON PEND	0%	0%
6	DIALIN	yes	X25			2	CON PEND	0%	0%
7	DIALIN	yes	X25			2	CON PEND	0%	0%
8	DIALIN	yes	X25			2	CON PEND	0%	0%
9	DEDIC	yes	X25	474	awipsOUN	RPGOP	CONNECT	0%	96%
10	DEDIC	yes	X25	2	rgopTLX-OUN	1	CONNECT	1%	92%
11	DEDIC	yes	X25	1		1	CONNECT	0%	93%
12	DEDIC	yes	X25	620	awipsROC	1	CONNECT	3%	92%
13	DEDIC	yes	X25	21	pupTIK	1	CONNECT	1%	92%
14	DEDIC	yes	X25	803	opup260WS	1	CONNECT	0%	92%
15	DEDIC	yes	X25			1	CON PEND	0%	0%
16	DEDIC	yes	X25	737	warpZFW	1	CONNECT	0%	93%
17	DEDIC	yes	X25			1	CON PEND	0%	0%
18	DEDIC	yes	X25			1	CON PEND	0%	0%
19	DEDIC	yes	X25			1	CON PEND	0%	0%
20	DEDIC	yes	X25			1	CON PEND	0%	0%
21	DEDIC	yes	X25			1	CON PEND	0%	0%
22	DEDIC	yes	X25			1	CON PEND	0%	0%
23	DEDIC	yes	X25			1	CON PEND	0%	0%
24	DEDIC	yes	X25			1	CON PEND	0%	0%

Sorted By: ○ Line   ○ Type   ○ Status

Line Control

Reset   Disconnect   Connect   Deselect

General Parameters

Retries 2   Timeout 120   Alarm (%) 100   Warning (%) 95

Line Management

Line # 1   Comm Mgr # 1

Type Dial-in   PServer # 1

Port Pswd ****   Time Limit 0

Baud Rate 14400   Comms Option No

Line/User Info

User ID   Class 2

User Name   Method N/A

Dial-in Users

Prev ◀ [Users 1 to 57 of 804] ▶ Next

User ID/Name	Pswd	Ovr	Class	Method
1 [HOTLINE]	****		2	N/A
2 [rgopTLX-OUN]	****		2	N/A
10 [pupXMR]	****		2	N/A
11 [pupCOF]	****		2	N/A
12 [pupADW]	****		2	N/A
13 [pupLTS]	****		2	N/A
15 [pupSPS]	****		2	N/A
17 [pupVPS]	****		2	N/A
19 [pupPAM]	****		2	N/A
21 [pupTIK]	****		2	N/A
22 [pupZDC]	****		2	N/A
24 [rgopDDC]	****		2	N/A

Add Dial-in User   Delete Dial-in User

Figure 10. The Product Distribution Comms Status window.

The ability to send and receive messages to and from users of an RPG's data is still an important feature. With the ORPG, this task is initiated through the Console Messages button.

Console Messages

Console Messages Window | In the Console Messages Window, the lines for potential recipients are listed under Destinations. The recipients are selected by checking the appropriate box. See Figure 11.
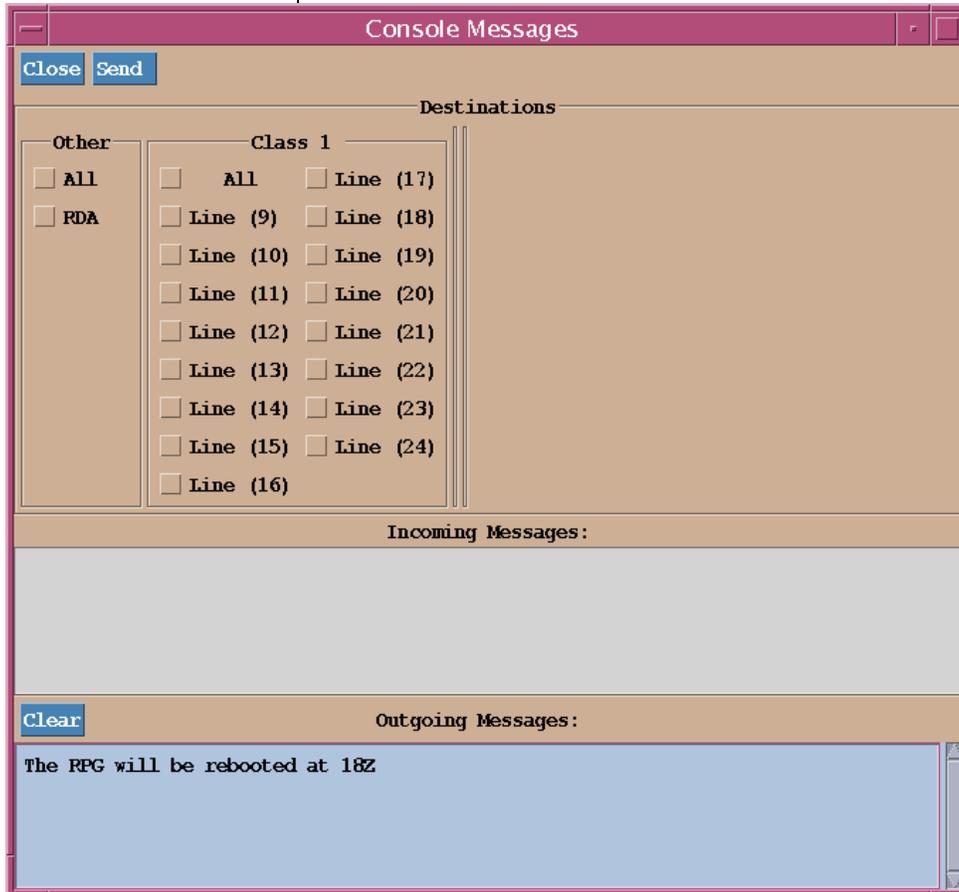
Figure 11. Console Messages Window

The most significant difference with the ORPG compared to the legacy system (Free Text Messages) is with message composition. Message composition has some basic word processing features such as carriage returns and inserting text. The Clear button will clear all text from the outgoing message box. Once a message is composed, clicking on the Send button will send the message to the selected users.

Base Data Display | Base Data Display is a new feature with the ORPG, where Base Data are displayed as

received from the RDA. These data are not yet processed by the RPG. For example, the velocities are not yet dealiased. When changes are made at the RDA, this feature can be used to investigate the effect on the Base Data. For example, when a clutter suppression regions file has been downloaded to the RDA, the Base Data Display can be used to determine if the clutter filtering is having the desired effect. The Base Data Display window is accessed from the Base Data Display applications button.
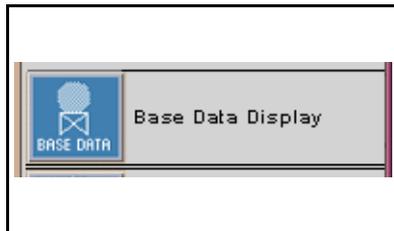
The Base Data Display Window (See Figure 12) allows the selection of the type of Base Data (Reflectivity, Velocity or Spectrum Width) to be displayed. On the left hand side, the current VCP is displayed along with a table of elevation angles. Specific elevation angles can be selected for display, or selecting the Scan button will result in each angle being displayed as the data arrive.

The Moment buttons (R, V, or W) allow for selecting the type of Base Data to be displayed.

The Mode section has two choices, Raw or Zoom. In Raw mode, clicking the cursor in the data area will provide the azimuth, range and data value for that point. In Zoom mode, mouse clicks allow for zooming into an area of interest.

Base Data Display Window
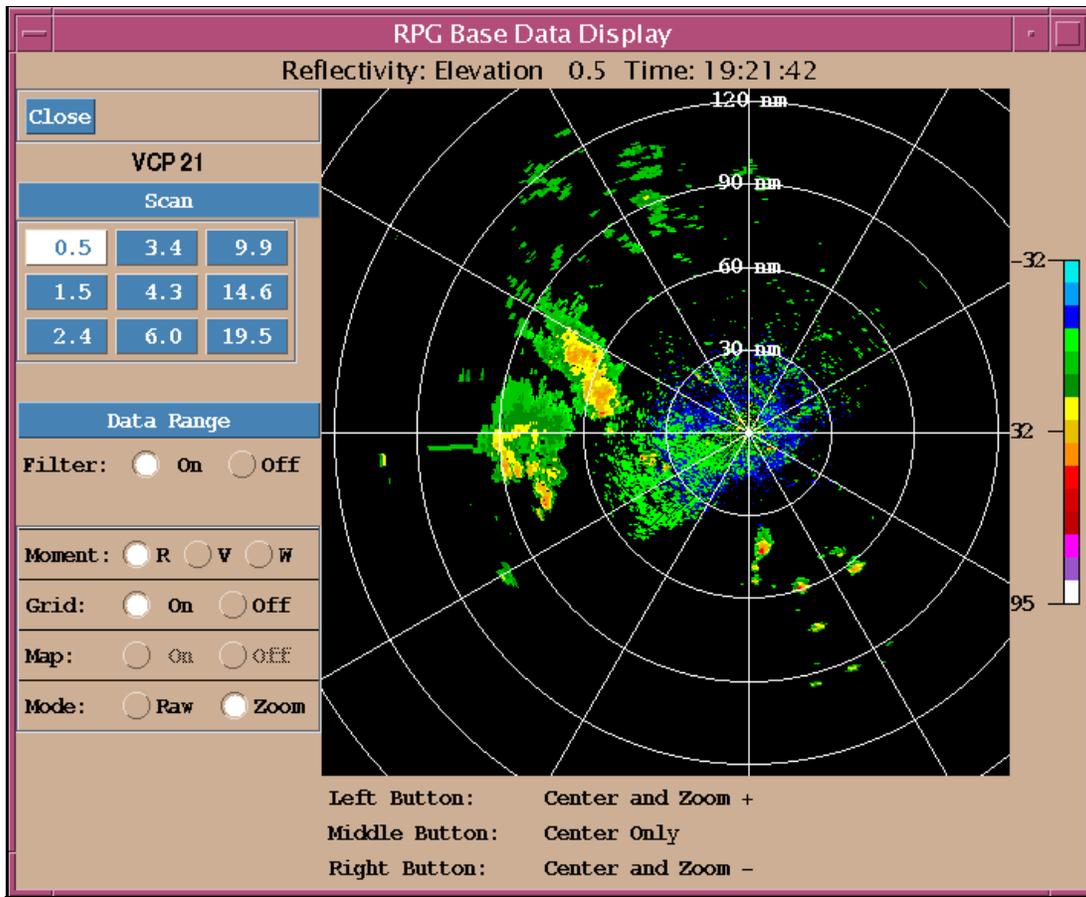
Figure 12. Base Data Display window.

The Data Range button accesses the Set Data Range window. This window allows for the display of a specific range of base data values, e.g. Base Reflectivity from 20 to 70 dBZ. Adjustments to the data range will have **no** effect on the Base **Products**, since only Base **Data** are being displayed. Also, maps are not currently available except for a polar grid. See Figure 13.

Figure 13. Data Range selection window for the Base Data Display.

From time to time, restarting the RPG will be necessary. The RPG Control window is accessed from the RPG Control button on the HCI Main Screen.
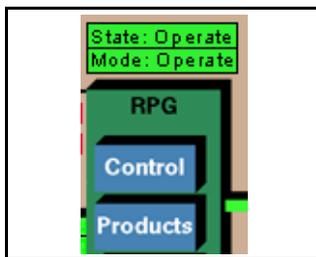
RPG Control

The RPG Control window has RPG status information across the top. The current RPG Operable Status and RPG State are indicated by red or green background colored buttons. In this example

RPG Control Window

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(see Figure 14) both conditions are in operate status with a green background.
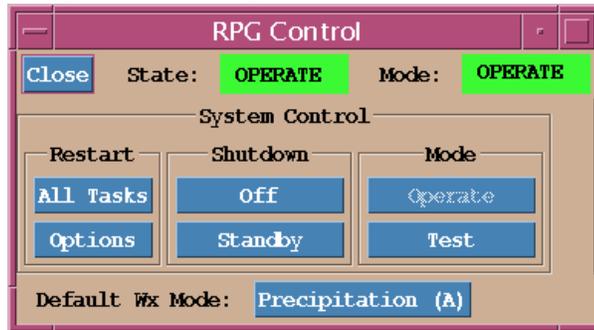

Figure 14. RPG Control Window

RPG Reboot | From the RPG Control Window, the first step is to shut down the RPG to Off, selecting the Off button under Shutdown. The RPG State will change from OPERATE to SHUTDOWN, with the background color changing from green to red. To restart, select the All Tasks button, which will restart all tasks. The RPG State will change from SHUTDOWN to TRANSITION to OPERATE. The color transition will also go from red to yellow to green.

PRF Selection | Selecting a specific Doppler PRF is done to prevent a storm of interest from being obscured by range folding. Most of the time, Auto PRF will be on, since it is designed to minimize range folding overall. However, to select a specific PRF, Auto PRF must first be turned off, then a new PRF selected. Auto PRF can be toggled on or off as needed from the HCI Main Screen.
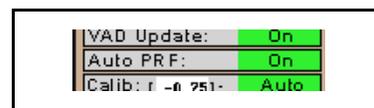
The process of selecting a PRF is initiated from the PRF Selection button.

Clicking on the PRF Selection button will bring up the PRF Selection (Modify Current VCP) Window.

PRF Selection (Modify Current VCP) Window
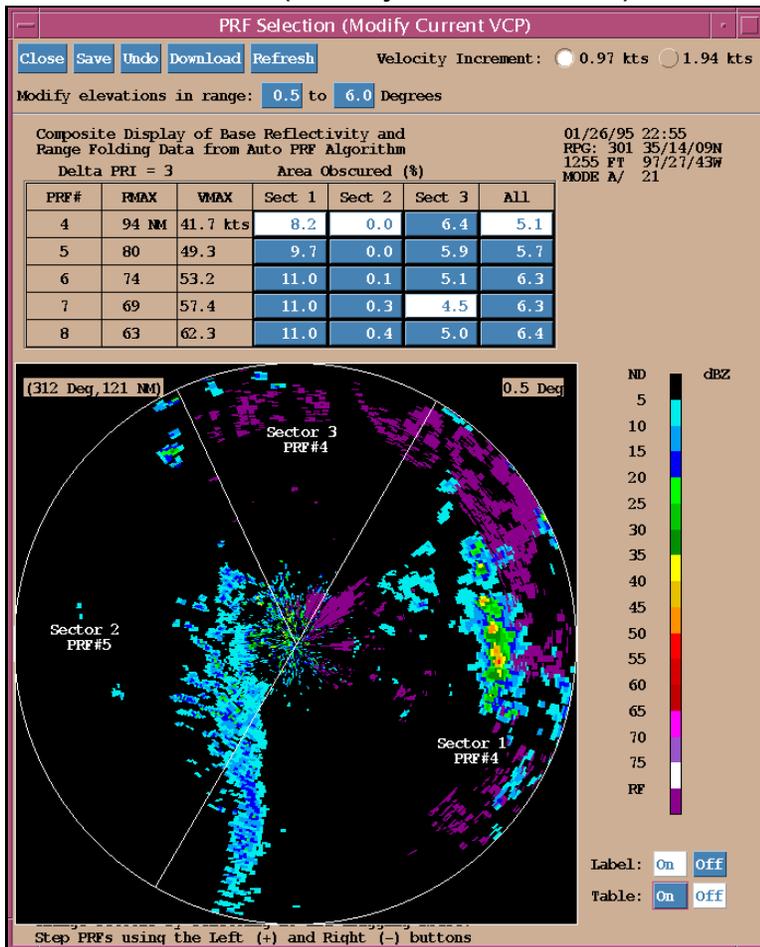
Figure 15. PRF Selection (Modify Current VCP) Window

Near the top of the window, the elevation angles affected by PRF changes can be selected up to 19.5° (in Precipitation Mode). However, Range Unfolding is performed only on the angles from 0.5° through 6.2°.

Some of the information displayed in the PRF Selection (Modify Current VCP) Window is from the Auto PRF algorithm. Each volume scan, the 0.5° Base Data are examined by the Auto PRF algorithm. For each of the Doppler PRFs, the extent of range folding is computed. When "on" is selected, Auto PRF will select the Doppler PRF

Auto PRF

that minimizes range folding overall each volume scan. The current VCP is then updated with that Doppler PRF, and downloaded to the RDA. In order to manually select a Doppler PRF, Auto PRF must first be set to "off". The current VCP can then be edited with the desired PRF, then downloaded to the RDA.

There are two primary areas of the PRF Selection Window, tabular and graphical. Edits can be made in either area. The graphical area will display the effect on the data of any chosen PRF.

Graphical PRF Selection

The Base Data displayed is a composite of Base Reflectivity and the range folding present on the velocity products. This allows a comparison to determine the potential that a significant feature could be obscured by range folding. This 0.5° composite base data can be updated (with the last completed 0.5° data) at any time by selecting the Refresh button.
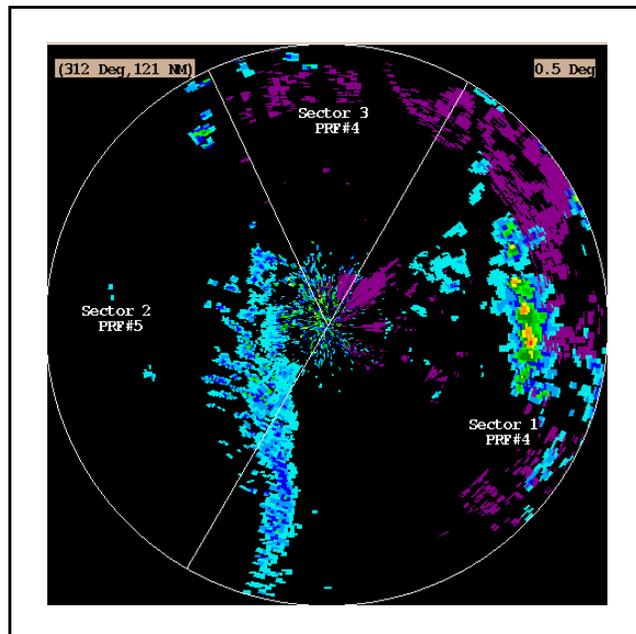
The Graphical Editor can be used for PRF selection and sector definition. PRFs are selected by

left clicking on the PRF label in each sector. With each click, the effects of this different PRF are displayed. The sectors can be edited by clicking and dragging the sector boundaries. As the boundaries of the sectors are changed, these changes are reflected in the PRF table as well.

In the Graphical Editor, the Label button (see Figure 15) toggles the Sector and PRF # information for each sector on or off .

In the table, the Doppler PRF numbers and their associated R_{max} and V_{max} values are displayed. For each of these PRFs, the percent area obscured by range folding at $0.5°$ is displayed for each sector and for the total area. The percent of obscuration from range folding comes from the Auto PRF algorithm. For each sector and the total area, the minimum percent of obscuration is highlighted with a white background. This will quickly identify which Doppler PRF results in the minimum obscuration for each sector and for the total area.

Tabular PRF Selection

PRF#	RMAX	VMAX	Sect 1	Sect 2	Sect 3	All
4	94 NM	41.7 kts	8.2	0.0	6.4	5.1
5	80	49.3	9.7	0.0	5.9	5.7
6	74	53.2	11.0	0.1	5.1	6.3
7	69	57.4	11.0	0.3	4.5	6.3
8	63	62.3	11.0	0.4	5.0	6.4

PRFs can be selected from this table for a given sector by clicking on the obscuration value. For each PRF selected, the graphical display will then show the effect on the data.

PRF editing can also done in a table just like was done at the legacy UCP. By selecting the Table On button (see Figure 15), the Modify Current VCP Adaptation Data Window will open.

PRF Editing a la Legacy System

Modify Current VCP Adaptation Data

Close Undo   Show: ○ PRF# ○ RMAX (NM)   Velocity Increment: ○ 0.97 kts ○ 1.94 kts

Elevation #	Degrees	Scan Seconds	Waveform Type	Sector 1 Azimuth	PRF #	Sector 2 Azimuth	PRF #	Sector 3 Azimuth	PRF #	Signal/Noise Ratio (dB) Refl	Vel	Width
1	0.5	32	CS	0.0	1	0.0	1	0.0	1	2.00	2.00	2.00
2	0.5	32	CD/W	30.0	4	210.0	5	335.0	4	3.50	3.50	3.50
3	1.5	32	CS	0.0	1	0.0	1	0.0	1	2.00	2.00	2.00
4	1.5	32	CD/W	30.0	6	210.0	4	335.0	4	3.50	3.50	3.50
5	2.4	32	B	30.0	6	210.0	4	335.0	4	3.50	3.50	3.50
6	3.4	32	B	30.0	6	210.0	4	335.0	4	3.50	3.50	3.50
7	4.3	32	B	30.0	6	210.0	4	335.0	4	3.50	3.50	3.50
8	6.0	32	B	30.0	6	210.0	4	335.0	4	3.50	3.50	3.50
9	9.9	25	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
10	14.6	25	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50
11	19.5	25	CD/WO	30.0	7	210.0	7	335.0	7	3.50	3.50	3.50

Azimuth Range: (0 to 359.9) – SNR Range: (-12.0 to 20.0 dB)

The table in this window allows for PRF editing as was done at the UCP. Changes to the PRFs in the table are displayed on the graphical editor as well.

Save and Download

Once the desired PRF is selected, close the window. From the PRF Selection window, the file is then saved and ***downloaded*** to the RDA, using the Save and Download buttons at the top of the window.

Environmental Data

Environmental Data involves current atmospheric conditions which support three different WSR-88D algorithms.

1. The Environmental Winds Table (EWT) provides wind speed and direction from the surface up to 70k ft. The data in this table are used by the Velocity Dealiasing Algorithm to dealias suspect velocities.

2. The Hail Temperature Heights are the heights of the $0°$ C and the $-20°$ C isotherms. These data support the Hail Detection Algorithm.

3. The Default Storm Motion is the speed and direction of the first identified storm(s), supporting the Storm Cell Identification and Tracking Algorithm.

The Environmental Data Editor is accessed by clicking on the Environmental Data button. If the graphical portion of this button is outlined in red, the EWT was updated 12 or more hours ago.

The Environmental Data Editor Window has a graphical data entry format. The Environmental Winds, Hail Temperature Heights and Default Storm Motion can all be edited from this window. See Figure 16.

Environmental Data Editor Window
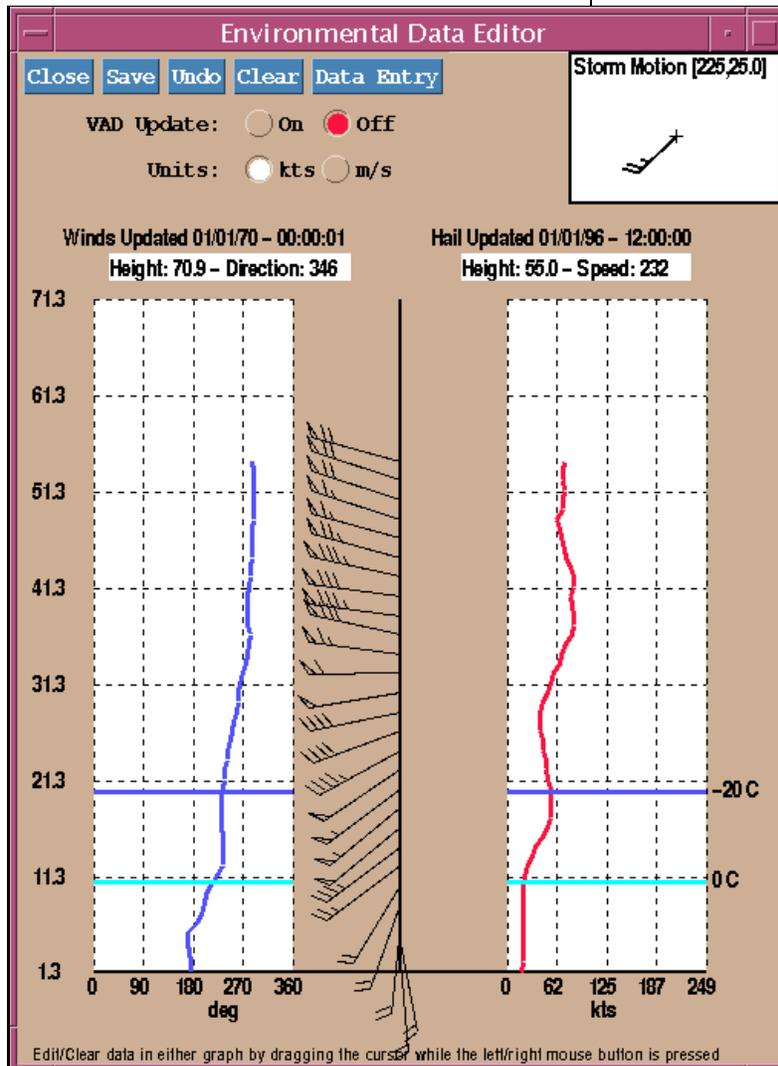
Figure 16. The Environmental Data Editor window.

Editing the Environmental Winds Table (EWT)	Velocities calculated by the Velocity Azimuth Display (VAD) algorithm are output to the VAD Wind Profile (VWP) product and the EWT. Most of the time, VAD Update will be enabled for routine inputs to the EWT. However, VAD Update is typically disabled prior to making manual edits to the EWT. If changes are made without disabling the VAD Update, the operator will be prompted to do so once an attempt is made to save the changes.
VAD Update Status and Units Selected	Whether or not VAD Update is enabled is indicated by the on or off buttons. In Figure 16, the VAD Update is not enabled. The units, kts or m/s, which are currently selected are also indicated. In Figure 16, units of kts are currently selected.
Wind Speed and Direction by Height	Environmental Wind Heights are displayed in MSL. The first level is the surface with remaining levels at 1,000 ft increments up to 70k ft. For any given height, the wind direction in the EWT is shown on the left side graph while the wind speed is shown on the right side. Editing either side is done by clicking on the curve at the appropriate height, and dragging it to the new speed or direction with the mouse. Interpolation is done automatically between levels.
Saving Edits and Closing the Window	If you attempt to close the window after changes have been made and not yet saved, a window will pop up asking if you want to save changes. Further, since the VAD Update was disabled while edits were made, a secondary window will pop up asking if you wish to enable it. Answering "yes" will update the EWT with all available VAD winds every volume scan starting with the next completed volume scan.
Editing the Default Storm Motion Graphically	The Default Storm Motion can be edited by clicking and dragging on the wind barb. The direction is

changed by rotating the barb, while the speed is changed by adjusting its length.

The horizontal lines corresponding to 0° C and -20° C are displayed on the Environmental Winds Editor window. The heights are changed by clicking on the label (-20° C and 0° C) and dragging the cursor up or down.

| Editing the Hail Temperature Heights

To perform edits in a tabular format, access the Data Entry window by clicking on the Data Entry button on the Data Editor window (Figure 16). The Data Entry window allows editing of the Environmental Winds Table, the Default Storm Motion, and the Hail Temperature Heights (See Figure 17).

| Environmental Data Entry Window

Figure 17. The Environmental Data Entry Window.

Wind speed and direction can be entered for any level. Turning "Interpolate between levels" on will

| *Environmental Winds*

calculate speed and direction for any levels left blank.

Once edits are made in the Environmental Data Entry Window, select Close. The edits can then be saved from the Environmental Winds Editor Window.

VCP Selection

The current VCP is easily identified from the HCI front page. The current VCP button displays information about the current VCP. This button is also used to access the VCP Control window when changes need to be made.
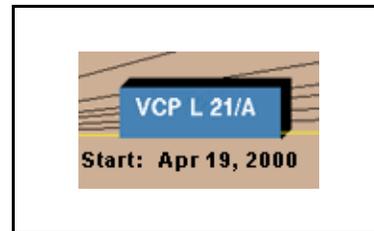
In addition to the VCP number, the origin of the current VCP and the weather mode is also displayed. For example, an entry of VCP L 21/A means that the radar is operating in VCP 21, which is weather mode A. The L means that the VCP is a local version, where local refers to the RDA. Thus a copy of VCP 21 resident on the hard drive at the RDA was loaded as the current VCP. The other possible entry would be R for remote. This would alert the operator that the current VCP 21 was downloaded from the RPG hard drive.

VCP Control

In order to initiate any VCP changes, the VCP Control window must first be accessed by clicking on the current VCP button. The VCP Control window is the starting point for any VCP changes.

The VCP Control window provides a means to accomplish a number of tasks. The top line of the

Figure 18. VCP Control Window

window has on and off buttons for Auto PRF. The selection of VCPs occurs in two areas of the VCP Control Window. The first is using the Change command to select a VCP that is stored at the RDA. The second is using the Download command to select a VCP that is stored at the RPG to be sent to the RDA. The last area of interest is the Modify VCP selection. Here, the current VCP can be edited, as well as one of the Adaptation VCPs which are stored at the RPG.

From the VCP Control window, following Modify VCP:, select the Current button. The brings up the window titled PRF Selection (Modify Current VCP). The title reflects the fact that the most common reason to edit the current VCP is to change the PRF, which is discussed in the PRF Selection section beginning on page 24. The other reason would be to change the Velocity Measurement Increment.

Editing the current VCP

There are copies of the four VCPs (11, 21, 31, and 32), stored at the RPG and the RDA. The "local" set is stored at the RDA and is part of RDA adap-

Changing vs. Downloading a VCP

tation data. The VCPs in this set are not modifiable. The local versions of VCPs 11 and 21 are defined with PRF #5. Selecting one of the local VCPs is done using the "CHANGE to RDA VCP" area of the VCP Control Window.

The "remote" set of VCPs is stored at the RPG and is part of the RPG Adaptation Data. The remote versions of VCPs 11 and 21 are defined with PRF #4. Selecting one of the remote VCPs is done using the "DOWNLOAD VCP from RPG" area of the VCP Control Window.

For VCPs 11 and 21, the difference in PRF # for the local vs. remote versions provides a quick way to change the PRF. For example, PRF #4 has a R_{max} of about 95 nm, which is the longest R_{max} currently possible. In cases where this is desired, simply downloading remote VCP 11 or 21 will enable PRF #4, rather than the more lengthy process of editing the current VCP.

Clutter Suppression

The environment for managing clutter suppression with the ORPG is significantly different than with the UCP. There is more flexibility with respect to file structure and editing is done in a graphical environment.

Clutter Suppression Regions Files

With the legacy RPG, there are four clutter files available, named 11, 21, 31, and 32. With the ORPG, there are twenty files available, and they can be named as desired. Filenames can be up to 31 characters long. Names that describe the type of clutter problem addressed by the file are recommended. Each file can contain up to 15 geographic regions.

Baseline Set of Files

The baseline set of files is designed to provide a group of clutter suppression regions files available

for a variety of clutter suppression needs. Managing the baseline set will require knowledge of two important buttons on the clutter regions files window.

Selecting Update will update the baseline set of files to include any newly defined and saved files.

Update

Selecting Restore will reload the most recently updated baseline set of files. Any new file that has been defined and saved but is **not** yet part of the baseline set **will be lost**.

Restore

New files that have been defined and saved are available for downloading or editing **as long as the Restore button has not been selected**.

The Baseline Set of Files will always include a file called Default. The clutter configuration of this file has the Bypass Map in control for all azimuths and elevation angles. It is assumed to be the default clutter configuration for most locations, and can be used as such.

Default File

The Clutter Suppression Regions File editor window is accessed by selecting the Clutter Regions button.

Clutter Suppression Regions File Editor Window

The Clutter Suppression Regions File editor window (see Figure 19) has many features. When the window is initially opened, the clutter regions file displayed is the file most recently downloaded, i.e. currently in use.
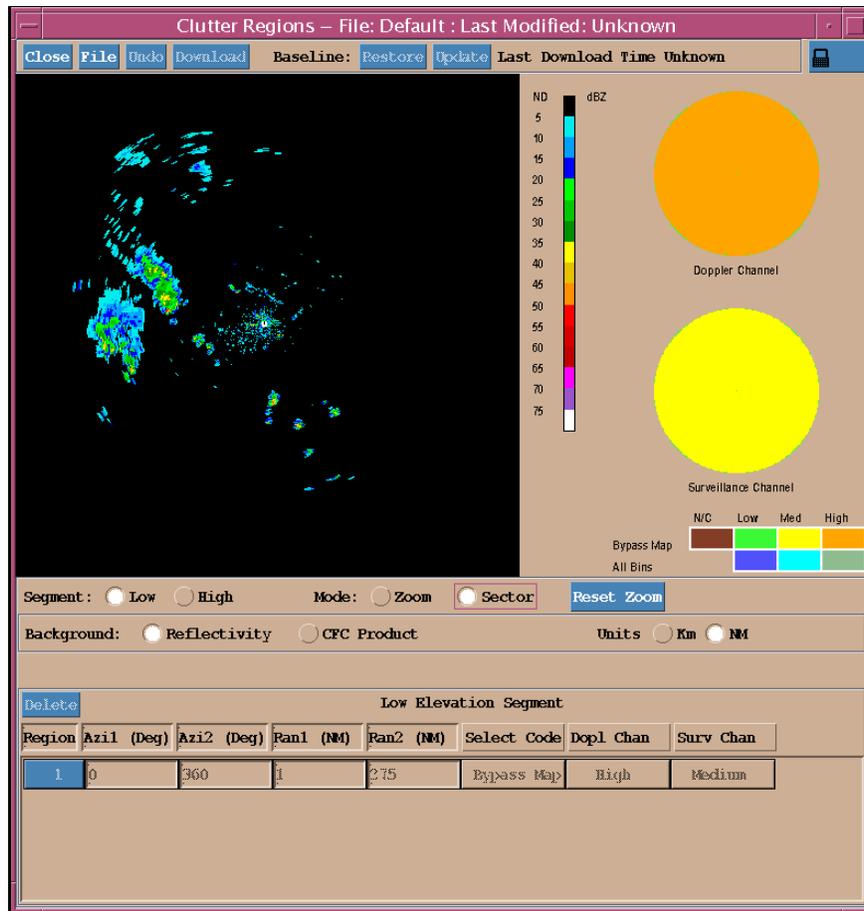
Figure 19. The Clutter Suppression Regions File editor window.

|	
Features	The Restore and Update buttons are located at the top of the window, along with Close, File, Undo, and Download. File is used to start creation of a new file, to save a file, or to retrieve a previously saved file. As with the legacy system, a file *must* be downloaded to the RDA in order to take effect.
LOCA Password	The padlock in the upper right indicates that the edits in this window have a Level of Change Authority (LOCA) that requires a password.
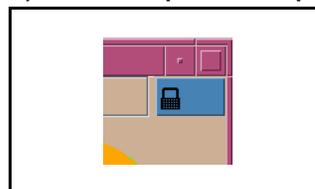
See page 12, "A Word About LOCAS", for information on LOCAs and passwords.

Changes to Clutter Regions files are under the Unit Radar Committee (URC) LOCA. In order to make and save changes, the padlock must be unlocked with a password. Clicking on the padlock will open the password window.
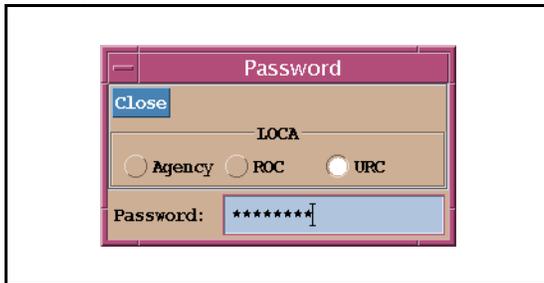
Once the password for URC is entered and this window is closed, the padlock on the Clutter Regions definition window will be open and changes can be made and saved.
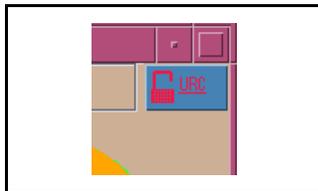
The large graphical area is where the definition of clutter regions is made. Once drawn, the dimensions (start and stop azimuths and ranges) the regions are displayed in the table at the bottom of the window. As a background for drawing the regions, the latest 0.5° Reflectivity or Clutter Filter Control product can be selected. Edits can be made in units of km or nm. See Figure 20 for an example of regions defined.

Graphical Editor

Low or High Segment can be selected for clutter definition. The low segment is the elevation angles below 2.0° (0.5° and 1.5°), while the high segment is the angles above 2.0°. If a clutter regions file

Elevation Segments
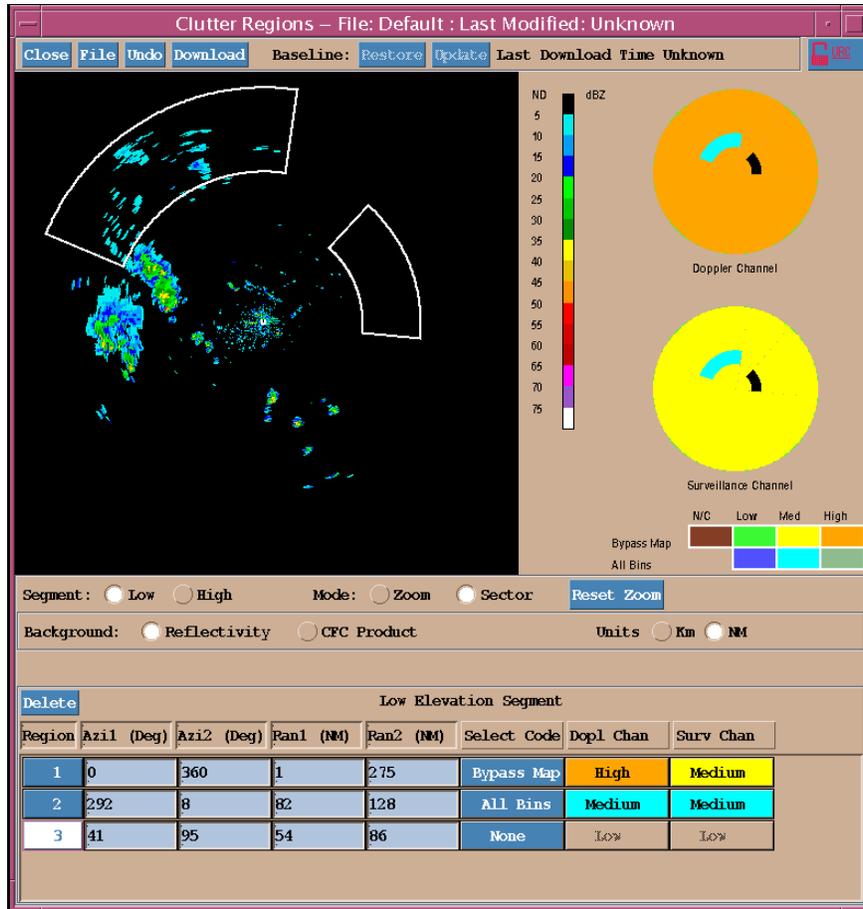
Figure 20. The Clutter Suppression Regions File editor window with defined regions.

has regions defined for both the low and high segments, they will be displayed in the table separately.

Adding a Region | To add a region to a file, drag the cursor along a radial for range and counterclockwise through the desired azimuths. The dimensions (start and stop azimuth and range) will be displayed in the table. This new region will have a number with a white background. Within the table, select the type of filtering needed, Bypass, All Bins, or None. Finally, select the level of suppression, Low, Medium, or High for the Doppler and Surveillance Channels.

The region just constructed will be depicted on the Doppler and Surveillance Channel graphics on the right side of the display.

As with the legacy RPG, in order for any clutter suppression regions file to be invoked, it must be downloaded to the RDA. With the ORPG HCI, selecting the Download button will send the file currently displayed to the RDA.

Downloading

Summary

The ORPG Deployment phase is planned to continue through the summer of 2002. As experience in using this new system grows, there will likely be some lessons learned. Those of us at WDTB would be interested in hearing about how the ORPG affects your office operations. Information relevant to the ongoing ORPG Teletraining will also be available on the WDTB web site.

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As with any other part of the WSR-88D system, support for both operators and maintainers is available from the ROC Hotline.

1-800-643-3363